

LIVERMORE LAB REPORT

A weekly compendium of media reports on science and technology achievements at Lawrence Livermore National Laboratory, Aug. 11-15, 2014. Though the Laboratory reviews items for overall accuracy, the reporting organizations are responsible for the content in the links below.



LET THERE BE LIGHT



This artist's concept illustrates a supermassive black hole with millions to billions times the mass of our sun. Image courtesy of NASA/JPL-Caltech.

NASA's Nuclear Spectroscopic Telescope Array (NuSTAR), in which Lawrence Livermore plays a big role, has captured an extreme and rare event in the regions immediately surrounding a supermassive black hole. A compact source of X-rays that sits near the black hole, called the corona, has moved closer to the black hole over a period of just days.

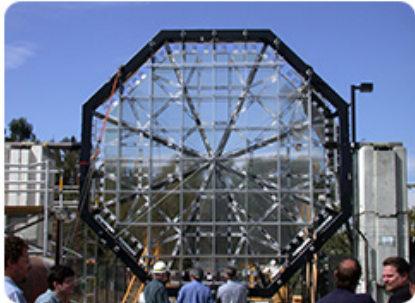
The corona recently collapsed in toward the black hole, with the result that the black hole's intense gravity pulled all the light down onto its surrounding disk, where material is spiraling inward.

As the corona shifted closer to the black hole, the gravity of the black hole exerted a stronger tug on the X-rays emitted by it. The result was an extreme blurring and stretching of the X-ray light. Such events had been observed previously, but never to this degree and in such detail.

To read more, go to [Photonics Online](http://www.photonicsonline.com).



IT'S ALL ORIGAMI TO ME



Lawrence Livermore built the Eyeglass Telescope using computational origami to make foldable mirrors.

Origami isn't just for making paper cranes. Origami principles are now used in a wide variety of applications -- from the design of satellites, to heart stents, to self-assembling robots and much more.

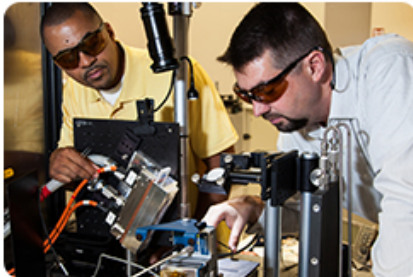
Lawrence Livermore National Laboratory designed the Eyeglass Telescope using computational origami to make a foldable lens.

A prototype of this enormous telescope -- which would have stretched the length of Manhattan -- was built, although the final work was never completed.

To read more, go to [Popular Science](#).



WELDING NEW PARTNERSHIPS



Ibo Matthews (left) and Brad Baker studying a plate of HY-80 steel.

Cmdr. Brad Baker, assistant professor of mechanical engineering at the U.S. Naval Academy, recently completed a six-week stint at Lawrence Livermore National Laboratory as part of the visiting scientist program.

Baker has conducted research in conjunction with Livermore for more than three years, including a material characterization study of nuclear materials and joining methods. This summer, a project focused on laser-assisted friction stir welding brought him to the Lab.

"This was a chance to take the Lab's laser expertise and combine it with a welding technique called friction stir welding, a technique that the Lab is interested in and that I have experience in applying," Baker said. "We are trying to merge those two technologies and create a technology called diode laser-assisted friction stir welding. If we can heat the material up first with lasers, the process may become more efficient."

To read more, go to Phys.org.



A new material developed by Lab researchers could be used for energy storage and conversion.

Lawrence Livermore researchers have made a material that is 10 times stronger and stiffer than traditional aerogels of the same density.

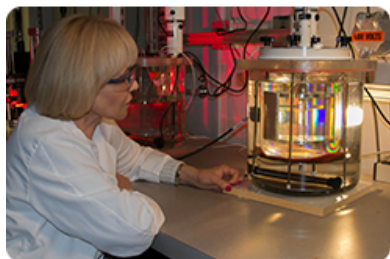
This ultra-low-density, ultra-high surface area bulk material with an interconnected nanotubular makeup could be used in catalysis, energy storage and conversion, thermal insulation, shock energy absorption and high energy density physics.

Ultra-low-density porous bulk materials have recently attracted renewed interest due to many promising applications.

To read more, go to [R&D Magazine](#).

HispanicBusiness.com

AND THE AWARDS GO TO ...



LLNL materials scientist Natalia Zaitseva checks out a stilbene crystal. The technology for growing these crystals has been licensed to Inrad Optics, a New Jersey photonics manufacturer. Zaitseva and her fellow scientists won one of three regional Federal Laboratory Consortium awards for technology transfer.

Lawrence Livermore National Laboratory scientists have been selected to receive three regional awards for technology transfer by the Federal Laboratory Consortium.

This year's awards will be presented Aug. 26 during the FLC's two-day Far West/Mid-Continent regional meeting at the Sheraton Denver Downtown Hotel in Denver, Colorado.

Started in 1974, the consortium assists the U.S. public and private sectors in utilizing technologies developed by federal government research laboratories.

To read more, go to [Hispanic Business](#).

LLNL applies and advances science and technology to help ensure national security and global stability. Through multi-disciplinary research and development, with particular expertise in high-energy-density physics, laser science, high-performance computing and science/engineering at the nanometer/subpicosecond scale, LLNL innovations improve security, meet energy and environmental needs and strengthen U.S. economic competitiveness. The Laboratory also

partners with other research institutions, universities and industry to bring the full weight of the nation's science and technology community to bear on solving problems of national importance. To send input to the *Livermore Lab Report*, send [e-mail](#)